TROPICAL AGRICULTURE

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TROPICAL AGRICULTURE is published at the Imperial College of Tropical Agriculture, St. Augustine, Trinidad, West Indies, at the end of the third week of the month preceding the one of issue. Advertisement rates can be obtained at the College from the Editor, or from the Secretary of the College, 14, Trinity Square, London, E.C. 3, England. The Editor will be glad to consider authoritative articles for publication. It is understood that opinions expressed in signed articles are those of the author and do not necessarily represent the policy or opinion of the College Authorities. Increasing numbers of inquiries are being received from various parts of the tropics which can be answered only by persons possessed of an intimate knowledge of local conditions. Enquirers should first satisfy themselves that their local Department of Agriculture is not able to supply them with the desired information before communicating with us. Correspondence which will be replied to is invited on all other matters pertaining to tropical agriculture, science and development.

THE ROYAL CHARTER.

By the granting of a Royal Charter on the 23rd November, 1926, the Imperial College of Tropical Agriculture may be said to have entered on a new phase of its existence. The grant of the Charter after the College has been in existence for the short period of four years only, means, in fact, that its importance has been realised and that the need for an Institution of this kind which not only undertakes original research in tropical agriculture and its cognate sciences but also provides definite courses of instruction in these subjects, has been recognised. The need for the more rapid economic development of the vast tropical possessions of the British Empire has become increasingly evident since the war and the provision of trained men who will be capable of pointing out the best way of tapping the potential agricultural wealth of these areas has become a matter of sheer necessity. The Imperial College of Tropical Agriculture having thus established its position as one of the essential keystones in the structure of tropical agricultural development, it will be as well to consider briefly what has been achieved during the short period of its existence and to give thought to the future lines of development. The development of the educational side of this Institution will be dealt with in this issue.

The College is now provided with some excellent buildings which house a portion of the staff and provide modern laboratory accommodation. The foundation stone of the central building, which is an inspiring stone edifice, was formally laid by Sir Samuel Wilson, K.C.M.G., the then Governor of Trinidad and Tobago, on 14th January, 1924, but even at that period the College had started work in the old buildings which had been handed over with the St. Augustine Estate by the Government of Trinidad. These old buildings have had to be thoroughly overhauled and reconditioned. Now the existing buildings, commodious as they are, are barely sufficient for the needs of the College and if the work expands as rapidly as it has done in the last eighteen months more laboratory accommodation will be urgently required. Plans have been made to meet this contingency and the matter is receiving the serious attention of those in authority. With the increase in the number of students, the erection of quarters for their accommodation has become a matter of serious moment, since the boarding facilities in the neighbourhood are now being tested to the uttermost. A Hostel for the accommodation of forty overseas students is about

to be erected together with a dining hall and recreation and reading rooms and it is hoped that these buildings will be completed by the time the next College year starts in October 1927. It has been decided to call these new buildings the "Milner Hostel," after the late Lord Milner to whose foresight and untiring efforts the College very largely owes its inception.

There is a marked change in the class of students this year. The post-graduates now outnumber the men taking the Diploma course, who are, in the main, recruited from the West Indian Colonies. The majority of the post-graduates are nominees of the Colonial Office and of the Empire Cotton Growing Corporation, and have been ear-marked for work in one or other of tropical Colonies after completing their course. A new departure has been the arrival of several senior students who are already in permanent Government service and who have come to the College at the instance of their respective agricultural departments to undergo a nine months course. This is an interesting development and is in our view a most sagacious move. The agricultural scientist working in one of the smaller colonies is more or less on his own, he has few opportunities of intercourse with men of his own profession and as a rule fewer facilities for real research. In spite of all he can do to counteract it, therefore, he is in danger of getting into a groove and of falling behind the times somewhat. The idea of allowing such officers to go through a "refresher" course is an excellent one and all such students will be assured of a ready welcome from the College.

The increase in the number of post-graduate and special students of this sort while very welcome has entailed a great deal of extra work on the staff. It should be understood that most of the students have already received an advanced scientific education before they leave home countries. They have all passed through and taken degrees at one or other of the English or Colonial Universities or Agricultural Colleges and their general scientific education is therefore, more or less complete as a rule before they join. If they are to do full justice to their opportunities at the Imperial College, therefore, it means that each man must have special attention from the members of the staff. Attendance at the courses in Tropical Agriculture and Agricultural Economics has now been made compulsory to each post-graduate since it is believed that detailed knowledge of these subjects will help the student in his work in whatever branch of agricultural science he afterwards specialises. At the same time, it is hoped that the knowledge he so gains will enable him to always keep in mind the importance of the economic side of his work. After all is said and done if an Agricultural Department in one of our Colonies requires an Entomologist, for instance, it requires an officer who will not only be able to unravel the life history of a pest, but who will also be able to work out practical ways of exterminating it or keeping it under control, and who can advise and work in close co-operation with the field officers of the Department to this end.

In addition to the two compulsory subjects, the post-graduate takes a third subject, which is the one he specialises in, and in addition is set a problem of research in the field, also bearing on his special subject, which he is required to work on and to write up at the end of his period at the College. A mention is made of these facts since it is not always realised what an amount of individual attention has to be given to post-graduate students and that the corresponding call that is made on the time and energies of the members of the staff is necessarily severe.

A matter that is receiving a large amount of thought, since it concerns very closely the future well-being of the College, is the question of establishing a proper spirit of tradition. As has been pointed out above, the majority of the students are post-graduates and at present they only stay for one academic year. This means that the tradition and that feeling of *esprit de corps* so essential in all college life, is to a very large extent broken at the end of each year and that with each new session an attempt has to be made to rekindle the right spirit. This is not as it should be and the beginning of a new year entails a great strain on all members of the staff since it falls very largely on them to restart the College games and inculcate the right spirit of tradition. This matter can only be rectified in a satisfactory manner if arrangements can be made for a proportion of the post-graduate and senior students to stay on at the College for two years instead of one as at present. By this method, there will be an overlap and a sufficient number of senior men will remain to ensure that the College traditions are carried on permanently.

RUBBER-BUYING POOL.

A CREDIT of $40,000,000, guaranteed by a group of leading tyre and motor-car manufacturers, has been arranged through Wall Street bankers for the purpose of stabilising the price of crude rubber.

It is understood the manufacturers involved will pool their purchase of rubber through a central organisation. It is believed the plan will eliminate violent fluctuations and maintain prices at such levels that an additional 10 per cent. restriction in production under the Stevenson Act will be unnecessary on 1st February next. The tyre manufacturers mentioned in connexion with the pool are the United States Rubber Company, the Goodrich, the Good-year, the Firestone, and the Fisk concerns. The motor-car companies reported to be interested include the General Motors, Studebaker, Overland, Dodge, and Packard companies.—(*Manchester Guardian Commercial.*)

CO-OPERATIVE CREDIT.

Progress in India.

A COPY of the Presidential Address to the ninth Conference of Registrars of Co-operative Soeieties held in Bombay in 1926, has just been received. The Address indicates not only the extraordinary growth in the system but also the critical attitude adopted by the Registrars towards the systems for whose working they are responsible. The ultimate goal is kept constantly in view and there is a continuous conscious effort to adapt the systems towards that end. Since the previous Conference held in 1918 there has been a threefold increase in the number of societies, in capital and in membership, and the total sum of paid up capital and reserves has risen in a manner and to an extent which is highly satisfactory. The President rightly emphasized the fact that, "the greatest enemies of the co-operative movement to-day are those of our friends who wish to force the pace, to rush on to quick results, and to advance without consolidating our gains." The problem in India is so much greater than that of Germany and is so complicated by obstacles peculiar to the country and its social system that success will only come as the result of prolonged and persistent efforts. The success already achieved by the Raiffeisen type of society in India and the fact that seven years working of the recommendations of the Maclagan Committee on co-operation have necessitated comparatively little change in the Act, the rules, or the essential bye-laws, holds out promise of the eventual solution of the problem of village credit.

One of the greatest and most urgent problems—by no means peculiar to India—is the discovery and training of suitable leaders. Indian history abounds with the records of religious reformers and great warriors but is sadly lacking in sound economic leadership. The first task in approaching "the staggering problem of Indian poverty" is to study the case in detail, to analyse the causes, and then to discover remedies. Those responsible for the working of the societies must become experts in the rural economics of their particular provinces. Though individual peculiarities must be appreciated mere members render it essential to group the people and to organise these groups into higher organisations until a manageable organisation is achieved. It is recognised in India, at least, that the State alone cannot solve so vast a problem; the people must be taught to help themselves and to help each other. In other words there must be active co-operation among the members and, further, among the societies. These elementary but essential facts are, unfortunately, frequently neglected in systems elsewhere. Before obstacles can be overcome it is necessary to discover exactly of what those obstacles consist, to assess what is available for the purpose and to appreciate what is lacking.

Unfortunately the general ideas prevalent in India are essentially uneconomic. The prevailing customs and sentiments, some fortified by religious feeling, suitable perhaps in a past age, now make up a burden beyond the power of the people to bear. Without the acceptance of more economic ideas on matters of every day life there can be little hope; there must in fact, be something like a complete revolution in the general outlook. The problem resolves itself into this, do the people desire a higher standard of life and are they willing to work for it? If not, the causes for this lack of desire and willingness must be sought for and exposed and an attempt made to educate the people up to these needs. In India there exists ample evidence of the attractiveness of the life of serenity and leisured ease. It is insufficiently recognised to what extent the civilisation of India is based upon standards of work, of diet and of female labour forced upon her by centuries of strangling poverty. The panacea for poverty offered by the President is "fifty years of hard work, hard study, hard saving and hard living." Already definite progress has been achieved. Gradually there is being built up a sound system of rural credit which it is hoped, will eventually displace the vicious system which has persisted since the earliest times. An attempt is being made to create credit for the benefit of the borrower, instead of the lender, and to teach the borrower the right use of the credit which is being placed within his reach. In several provinces a sound mortgage policy is being introduced which, if successful, will go far to abolish the worst evils of the right to encumber property which everywhere has proved a temptation too strong for the small owner to resist. An endeavour is being made to link up the co-operative system of rural banking with the better known commercial banking.

The larger part of the problem of Indian poverty consists in finding profitable employment for the extensive leisure of the people. The tiny plots of land on which the majority of cultivators attempt to subsist will not provide whole time occupation for everyone and it is from the earnings of spare time that the extra amenities making up a higher standard of living must come. Subsidiary industries must be encouraged upon co-operative lines with the expert assistance of the Departments of Industries. The problems confronting the societies are vast, but they can be overcome provided the people can be taught to help themselves. Some so-called co-operative systems have indeed taught the people to help themselves to other people's money. The effect has been the reverse of that so naively imagined. Success, as India shows us, can come only as the result of real and active co-operation.

C.Y.S.

POST WANTED

In the West Indies as planter or engineer, applicant aged 40, single, 15 years' engineering experience ashore and afloat (chief engineer's certificate) one year farming, war service. Communications to be sent to George Aitken, Craigmarloch, Yoker, Dumbartonshire, Scotland.

THE AMERICAN COTTON INDUSTRY.

A Brief Survey.

By J. S. Dodd, B.A., F.R.G.S.

[*After a comprehensive tour through the American cotton fields and manufacturing centres, Mr. Dodd, who is connected with a Lancashire cotton firm, spent some days in Trinidad at the College and the Cotton Research Station. The following article gives an account of his experiences.*]

The American cotton industry may be divided into three parts—growing, marketing and manufacturing. The size of the whole represents a value of two and a half billion dollars per annum.

This year there is a probability that all previous records will be broken and that 18,000,000 bales will be picked, causing prices to drop 30 per cent. during the Autumn. This enormous crop following one of over 16,000,000 bales last year has considerably decreased the farmers' profits and almost brought the price down to the cost of production. It is to be hoped that Lancashire Spinners will be able to find better markets now prices have decreased, but at the same time our cotton growing Colonies are likely to suffer just when their production is on the increase.

America has 37,000,000 spindles or 22,000,000 less than Great Britain but at the same time consumed in 1925, 6,422,748 bales of American grown cotton, while Great Britain consumed only 3,022,000 bales of the United States crop. The British mills have, of course, been working "short time" for the last five years, but even in normal times our consumption barely exceeds 4,000,000 bales. The average counts spun in the United States are very much lower than in the British Mills, and so larger quantities of cotton are required.

The American manufacturing industry is divided between the New England States and the Cotton Growing States, the former having approximately 17,000,000 spindles and the latter 18,000,000. The difference between the two branches of the industry is immense. Labour is cheaper in the South than in the North. In the Northern mills it is no uncommon thing to see notices posted in seven or eight different languages, while in the South the operatives are chiefly English-speaking. The Northern mills are usually built round large towns while in the South a mill is built in the country and the workpeople move in and live around the mill so that eventually a new village springs up, with its own stores and public buildings, dependent on the mill and to a large extent owned by it. Nowadays the number of mills in the South is increasing, while in the North the number is actually decreasing.

Throughout the cotton States one finds colleges and experimental stations owned by the State in which they are built, and in addition a number owned by the Federal Government. Millions of dollars a year are spent by the different States and Federal Government on research work and very excellent results are being obtained. One achievement of the North Carolina State College Experimental Department has been the survey of soils throughout the State, and now any planter can obtain free of charge advice on the type of cotton to plant, on rotation crops and on fertilizers. Stating his county and particular location, for instance, he can obtain the correct proportion of phosphoric acid, Ammonia, and potash to use. Again by continuous research the Government station at Tallulah in Louisiana has obtained a method of controlling the boll-weevil by dusting the plants with Calcium Arsenate. Commencing with dusting by hand machines it has gradually progressed until now an aeroplane flying at a height of from ten to twenty feet can cover the same ground in a fraction of the time originally required and actually at less cost. The common cotton flea hopper, a pest which has rapidly increased in the last few years can be treated in a similar way by applications of sulphur. The loss in 1921 on account of weevil damage was 30 per cent. of the total crop. This was decreased to 8 per cent. in 1924, an enormous saving to the industry.

Cotton is bought from the planter in the local markets by merchants and shipped by them all over the world after collecting and re-sampling at the warehouses and compresses. Five years ago the Co-operative Marketing Associations commenced and there are now sixteen States with Growers Marketing Associations, handling in all nearly two million bales a year at the present time. The planter sends his bales into the head department and they are sold for him direct to the mills or to foreign merchants. All the profits are turned over to the planter except a small proportion which is retained for overhead expenses. By this method the planter obtains a better price for his cotton and the middleman disappears. How these associations will fare in the future remains to be seen, but they have considerable hold on the industry at present.

The United States have been blamed considerably of late for the present depressed state of trade in Lancashire. Figures contradict this so far as export trade goes. Of the goods manufactured in the States only 14½ per cent. are exported as compared with 80 per cent. of the British manufactures, but high tariffs of from 60 per cent. to 80 per cent. of value prevent British competition in the American Home market. Actually, Japan is our most serious competitor. Since the war she has increased her spindlage 50 per cent. and her exports 80 per cent. A normal working week in England and in Massachusetts is 48 hours. In England, during the operation of "short time" our week has been limited to 36 hours. The Southern States of America work as much as 60 hours while Japan has spindles running as much as 120 hours per week.

The fact which impresses one most in the whole American Industry is the free exchange of ideas and the delight with which they show one their methods. Everywhere I went I met with the greatest cordiality and hospitality. Many thanks are due to the United States Government Department of Agriculture, to several State Colleges and Farmers Co-operative Associations, and to innumerable merchants and manufacturers for their assistance and almost overwhelming hospitality.

VISIT TO ST. VINCENT.

THE Christmas vacation, short though it is at this College, afforded an opportunity for a visit to St. Vincent. The Acting Principal (Mr. G. Evans, C.I.E.) was accompanied by Dr. H. Briton-Jones, Professor of Mycology and Bacteriology, Mr. E. E. Cheesman, Professor of Agricultural Botany and Genetics and eighteen post-graduate students. The majority of the latter are specially interested in cotton since they are undergoing a final course of training at the Imperial College on behalf of the Empire Cotton Growing Corporation. The party sailed by the R.M.S.P. *Chaleur* on 26th December and returned by the s.s. *Ingoma*, arriving back in Trinidad on the 2nd January, and spending five full days in St. Vincent. The first morning after arrival was occupied in attending a meeting at which the chief planters and agriculturists of the Colony were present, the Chair being taken by the Acting Administrator, Mr. W. S. Rae. The discussions naturally centred round the cotton crop since this is the chief export of the Island. St. Vincent has been somewhat unfortunate this year in that its cotton crops have been severely attacked by a defoliating caterpillar (*Alabama argillaceae*). The origin of this pest was explained and methods of control discussed. The practical remedy seems to lie in co-operation amongst the various cotton planters, who should make such arrangements as would ensure that plenty of insecticidal dust is present on the Island together with a sufficiency of dusting machines, in case another outbreak occurs in the following season. Growers would then be in a position to tackle the first brood in its earliest stage and so keep the pest within reasonable bounds and thus minimise damage. Similarly a most useful discussion took place on the methods of controlling the pink boll worm (*Platyedra gossypiella* Saund.) which has seriously infected one or two plantations on the Windward side particularly. The necessity for uprooting and burning the plants on a certain date and of enforcing a definite "close season" of not less than two months was emphasised. Mr. Evans also mentioned the possibility of spread through the seed and mentioned some of his experiences in Queensland, where the pest has been kept from spreading by means of sterilizing the seed by heat. He promised to supply information with regard to the size, capacity, and cost of the specially designed Heaters that are now used for this purpose in Egypt, Queensland and other parts of the world.

The object of the tour was, however, mainly educational and the opportunity afforded to study the Sea Island cotton crop when grown on a commercial scale, was greatly appreciated by the students. A complete day was spent at the Government Cotton Ginnery where the process of grading, ginning and baling the cotton was observed and also the process of oil extraction and soap making. The rest of the stay was devoted to field excursions to various cotton, arrowroot and coconut plantations. The owners of these estates had, with traditional West Indian hospitality, invited the party to study their methods on the spot and spared no pains to explain the systems of working and manufacture. Special interest was taken in the cultivation of arrowroot and its manufacture, since this was a crop with which most of the party were unacquainted. An expedition was taken to the summit of Soufriere and observations were made of the country in this neighbourhood that had been devastated by the lava flows and deposits of ashes following the eruption of the volcano in 1902. To the students of plant ecology, the resultant growth of natural vegetation proved most interesting; to the agriculturists, the remarkable crops borne by the coconuts planted fifteen years ago on volcanic ash, proved illuminating. The coconuts of the Orange Hill Estate in particular were remarkable for their size and depth of meat and the trees are bearing remarkably well. In other areas on the other hand the trees were being attacked by a leaf scale and appeared to be suffering from some plant food deficiency.

The party left the Island with a feeling of regret that their stay could not have been longer and came away with the impression that the Colony is on a sound economic basis because it does not rely on one crop alone, since in addition to its specialized type of Sea Island cotton, it also produces large quantities of arrowroot, of which it has a practical monopoly, copra and syrup, and further grows its own foodstuffs being also in a position to export a small surplus to other Islands.

The thanks of the College are due to the Acting Administrator, Mr. W. S. Rae and to Mr. T. Jackson, the Superintendent of Agriculture, who was responsible for all the arrangements for boarding and the planning of the various tours. All members of the College party will carry away with them grateful memories of the unbounded hospitality and hearty welcome they received from the planting community both individually and collectively.

G. E.

The Editor will be pleased to send a gratuitous specimen copy of *Tropical Agriculture*, post free, to anyone interested in tropical development.

CROPS SUBSIDIARY TO CANE.

PROFESSOR J. SYDNEY DASH, B.S.A.

(*Concluded.*)

Provision Crops.

THE more important provision crops and those commonly in demand are sweet potatoes, yams, and tanias; under estate conditions the last two may be grown on a relatively small scale only; yams particularly require special cultivation and it could hardly be possible to do this except on a limited area. Sweet potatoes offer greater possibilities since they may be grown on a preparation similar to that of cane, the cuttings being merely inserted in the banks. Trinidad imports a not inconsiderable amount of sweet potato tubers and doubtless more could be utilized. Unfortunately, there appears to be at least two limiting factors in sweet potato production. In the first place early planted sweet potatoes continue to grow throughout the rainy season without producing many tubers and these, if any, are usually watery and insipid. Secondly, observations point to the fact that the larva of the pyralid moth *Megastes grandalis Guen.* is a potentially bad pest of this crop. It tunnels into the stems and tubers and has been responsible for much damage in the College plots at times. In regard to the first factor, indications are that varietal differences do exist and the writer has brought together a large variety collection obtained from different parts of the island with a view to testing out their relative merits for early planting. In respect to late planting—even in late December—fair results have been obtained with a number of varieties. It may be said at once that growing sweet potatoes as a "catch" crop with sugar-cane, the former planted say in October, is not to be recommended. Experiments have shown, *vide Tropical Agriculture* Vol. I, p. 95, that such a practice seriously compromises the yield of cane, but the crop might prove advantageous as a rotation crop and serve also as an additional fodder supply, the vines being greatly relished. Indeed it might very well be used to some extent as a cover crop as well, particularly where seed supplies of legumes are short. For this purpose those varieties which produce abundant leaf growth would be preferable. It is hoped to secure full data on these several points from the work at present in progress.

Special Crops.

Tobacco.—A considerable amount of information has been collected on this crop which has been under observation for the last three years. Last year the area handled was approximately ½-acre, from which 700 lb. of first quality cured leaf was reaped and realised 72 cents per lb.; in addition, there were 300 lb. of ratoon and low grade leaf, which realised 30 cents per lb. Encouraged by these results, the area has been increased to 1½ acres, ½-acre being devoted to breeding and selection work on some twelve commercial strains. A great deal of care and special work is necessary and tobacco cultivation on any large scale is not anticipated; but, apparently, there is room for it as a cash crop where those who grow it are prepared to devote the attention which it requires. In this connection it might be said that the heavier types for which there is a fair demand are easier to grow and handle than the light types, which although more valuable, require special curing facilities. Those who are interested are cordially invited to see what is being done at the College where the crop is planted towards the end of the rainy season in order to avoid damage from heavy rains at maturity. This crop it is proposed to deal with fully in another article.

Jute.—As noted in a previous number of this Journal, jute has been under observation since last year; the area this year covers about ½-acre and certain data will be available from these trials. The outstanding difficulty on the heavy cane lands will be the question of tilth, for as pointed out in the notes on cultivation in *Tropical Agriculture* Vol. III, p. 240, unless a fine tilth is secured it is impossible to obtain the even stand so essential to the final production of a good crop of fibre. It is important to remember too, that the critical period is the first month after planting and it is imperative to be so treated that the young plants receive no offset in the early stages of growth. It should not be forgotten, however, that the high price of jute at the present time, thus causing a constant upward trend in the price of sugar bags, makes it a crop which should be given a thorough trial.

Soya Bean.—From time to time attention is directed in literature to the great value of this crop. The industry has assumed enormous proportions in China and Japan on account of the oil, meal cake, soya sauce and other products. The beans yield from 10 to 13 per cent. of oil from ordinary methods of extraction; it has a large variety of uses and the meal or cake obtained as a residue is an extremely valuable cattle food. Various attempts at soya bean cultivation have been made in the Lesser Antilles from as far back as 1907, but have never passed the experimental stage; seed yields have been small and uncertain. The causes for this comparative failure have not been fully understood, but indications are that day length is an important factor, the soya bean responding very markedly to long-day illumination. Again, the organism associated with it (as is usual in most legumes) is not generally distributed in West Indian soils and appears difficult to establish after being introduced. The crop is receiving study with a view to discovering whether it can be made a remunerative one.

Conclusion.

In conclusion, it will be noticed in the topic under discussion that special stress has been laid on cover and forage crop production as being the most profitable for general utility purposes in the cane areas at the present time. No radical change in field management is indicated by their use and the objects achieved would be briefly:

1. Fuller use of land with corresponding greater control of weeds and grass.

2. Increased soil fertility from legumes cultivation.
3. Elimination of old ratoon fields as breeding ground for froghopper.
4. Reduction of the stock feed bill and better nourished animals with higher quality pen manure.

It will be appreciated that best results to the cane area as a whole can only be obtained by the closest co-operation possible on the part of all concerned and every effort should be made to treat the whole cane belt as if it were a single unit from the point of view of crop practice. The small cultivator would be expected to follow the lead of the large.

Considerable permanent grass areas will still exist in the form of traces, &c., between fields, and while a certain number of cart roads are a necessity it must be admitted that the ordinary estate trace is both wasteful of land and baneful in effect on the adjoining fields, being nothing more or less than a seed bed for the weeds and grass which infest them. With the general use of mechanical tillage which has now come to stay, the fields could be made larger by absorbing many of these traces in the cultivation and adopting temporary cart paths for haulage ; if feasible, the use of light portable rails for transportation purposes might also find a place in future developments.

Finally, while further contributions to our knowledge of the froghopper pest and its behaviour will be of great value, enough is already known for definite steps to be taken towards mitigation of the evil. To await the arrival of some nostrum which will banish froghopper is to court disaster ; therefore, let us begin now to tackle the problem seriously by adopting a sound agricultural policy which alone can safeguard the future.

THE EXPERIMENTAL FACTORY.

Acknowledgment of Valuable Gift.

WE wish to acknowledge through this medium the gift from the "Texas Company," through their local agents Messrs. G. F. Huggins & Co., Ltd. of various oils and greases which will practically satisfy the lubrication requirements of the Sugar Factory for Crop 1927.

The generosity of their concern has extended to the payment of the freight to Trinidad on this shipment which includes the following :

One Drum "Honor" (Dynamo) Oil.
Do. Cylinder Oil.
Do. "Altare" (General Lubrication) Oil.
Do. "Pinnacle" (Cylinder) Oil.
One Barrel "Crater" Compound.
One Barrel Cup Grease No. 3.

The "Texaco" products are already well known and extensively used in Trinidad and the West Indies generally. We are glad to include the name of the Texas Company in the growing list of generous friends of this Institution who realise the cost of Research and, by such welcome contributions, materially help to lessen the financial burden.

THE IMPERIAL CONFERENCE.

Problems of Research.

IN his introduction to the report of the Research Sub-Committee of the Imperial Conference, Lord Balfour states in unequivocal terms that if full use is to be made of the opportunity we must turn to applied science for aid.

"The Empire includes states and territories of the most varied economic capacity, possessing every gradation of climate and soil, every species of mineral wealth, subject in parts to special diseases with which only science can hope to deal ; enjoying in parts unique natural advantages which only science can fully develop. It possesses distinguished investigators in every branch of research. It has therefore everything to gain from full scientific co-operation, yet we can hardly flatter ourselves that we practise this, either within Great Britain or throughout the Empire."

Various recommendations are made in the report regarding the organisation of research. Co-operation can best be secured, it is suggested, by the extension of the number of Imperial bureaux for special fields of investigation. The existing bureaux for entomology, mycology, and tropical medicine have greatly facilitated the interchange of results obtained in various parts of the Empire. It will be left to the delegates to the forestry conference which will assemble in Australia and New Zealand in 1928, and the Imperial Agricultural Research Conference, already arranged for 1927, to decide whether Imperial bureaux in these fields are necessary.

It is made clear that it is not assumed that any organisation intended to serve the whole Empire should necessarily be situated in Great Britain. It is suggested, for example, in the event of it being decided to create an Imperial Veterinary Science Bureau, that this bureau should set up in South Africa, which is ideally situated for purposes of research into the diseases of domestic live-stock, being faced with a greater variety of diseases than any other part of the Empire. Although it is not suggested in the report, it is not improbable that the Agricultural Research Bureau, if decided upon, would be situated in Jamaica, for it is in connexion with the development of tropical agriculture that the greatest advances are to be expected.

Reference is made to the imperfect machinery for the interchange of information. As at present conducted, correspondence fails to meet the need for rapidity, and not infrequently, because of some gap or misunderstanding, fails to reach the best objective. Instead of complete reliance upon such bodies as the Colonial Office, the Imperial Institute, the specialised Imperial bureaux as the channels of communication of information, it is suggested in addition that direct communication should be established between the various parts of the Empire, through the accredited representatives of special broad fields of research.—(*Nature*, Vol. 118, No. 2979.)

TRINIDAD CANE FARMERS.

Committee's Report.

A COPY of the report of the Committee appointed by His Excellency the Governor to enquire into the cane farming industry has recently been received.

The importance of the cane farming industry to the sugar industry of Trinidad may be gauged from the fact that the cane farmers numbering on an average about 20,000, produce nearly 50 per cent. of the total quantity of cane used by the factories. During the past three years the average annual amount paid by the factories to the cane farmers has exceeded $1,000,000, ($1 = 4*s.* 2*d.*)

Disturbing differences of opinion have for some time existed between the cane farmers and the estates and with a view to promoting the welfare of the industry the above Committee was appointed with the following terms of reference: "To consider and report generally on any measures which appear desirable to promote good relations and the fullest co-operation between the sugar manufacturers and the cane farmers of the Colony; and in particular on the following points:

(*a*) The conditions of the tenure of land by cane farmers.
(*b*) The encouragement of the production of better quality canes by cane farmers.
(*c*) The method of determining the price to be paid for farmers' canes.
(*d*) The system of restricting cane farmers within a specified area to sell their canes to a particular factory (known as the limitation of areas)."

It was recommended "that land rented out for the specific purpose of the cultivation of canes should be held on:

(*a*) An Annual Tenancy with compensation if ejected.
(*b*) Or, alternatively, subject to three years' notice in lieu of compensation."

It is suggested that a list of approved valuators should be compiled and that instructions should be drawn up by the Cane Farming Standing Committee in order to secure uniformity in making valuations.

Most factories realise the importance of distributing planting material of the better varieties of cane and the hope is expressed that all will do so. Cane farmers are also urged to maintain nurseries for supplying themselves with such material. It is recognised that an effective incentive to the production of better quality canes would be provided if the factories could not only refuse to accept certain specified poor varieties but also give some monetary inducement for the cultivation of the varieties specially desired.

The determination of the price to be paid for farmers' canes has, in the past, given rise to considerable controversy. The Committee recommends that the price be calculated on a sliding scale such that "the value of one ton of canes for each crop be 5 per cent. of the average f.o.b. price of grey crystal (96° Pol.) at Port-of-Spain from 1st January to 30th June of that year," less certain charges including cost of haulage of canes from scales to factory, bags, haulage of sugar from factory to Port-of-Spain, lighterage and selling charges, which are fixed at £2 5*s.* 0*d.* per ton of sugar. (For the previous crop these charges amounted to £2 11*s.* 10*d.* per ton of sugar.)

Some witnesses urged that the factories should grant 4½ per cent. under a sliding scale together with a guaranteed minimum price of 12*s.* 6*d.* ($3.00) per ton for cane. The representatives of the factory owners felt themselves unable to consent to this proposal since they themselves received no guaranteed minimum price for their sugar, but they agreed that in the interest of the stability of the industry, they would, as long as possible, pay not less than 12*s.* ($2.88) per ton of cane. Under the sliding scale the price of cane would be only 11*s.* when sugar is £13 per ton and 10*s.* when it is £12 per ton. The Committee considers that the practice of paying large cane farmers a higher rate is quite justifiable.

The factory authorities recently introduced the system known as the "limitation of areas" whereby a cane farmer within a specified area is restricted in the sale of his cane to a single factory. While this system has caused some hardship to individual farmers this is outweighed by advantages resulting from the elimination of wasteful competition and unnecessary haulage. It is suggested that such grievances should be submitted to the Cane Farming Standing Committee for enquiry and, if desirable and possible, adjustment. Recommendations are also made for ensuring the correct weighing and recording of farmers' canes.

The Committee suggests the appointment of a Standing Cane Farming Committee for the purpose "of enquiring into and, whenever possible, settling any disputes and misunderstandings which may from time to time arise, and generally of promoting good relations between the cane farmer and the factory," and recommends that the law relating to cane farming should be consolidated in one Ordinance.

Printed with the Report are the minutes of evidence of the forty-six witnesses examined. In many ways these minutes are the most valuable portion of the Paper since they reveal the amazing ignorance of some of those who claim to represent the cane farmers. It is evident that much ill-feeling has been caused by the agitation of irresponsible individuals on imaginary points of grievance.

It would appear evident that entirely harmonious relations will never exist between the cane farmers and factory owners until some form of collective bargaining is introduced, *i.e.*, until the cane farmers are in a position to appoint representatives

empowered to enter into, and subsequently implement, agreements with the factory owners. The problem is rendered exceedingly difficult by the type of individual engaged in the cane farming industry but it is unfortunate that the terms of reference apparently precluded such a strong and representative committee from addressing itself to this particularly important problem. Even if the labour of the Committee produces no other result it will at least have dispersed an accumulation of "hot-air" hitherto dangerously pent up.

C.Y.S.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

AT the annual dinner of the Royal Society of Tropical Medicine and Hygiene the Earl of Balfour in proposing "The Royal Society of Tropical Medicine and Hygiene," referred to the problems presented to the country by the tropics, in which the expert and the inexpert alike were deeply interested.

One important problem was that of the tsetse fly in Africa. It was an appalling reflection that, looking back over the history of mankind, people should have to say that the greatest of all prehistoric discoveries, the discovery or creation of the domestic animal, over a vast area of Africa was rendered impossible because such animals could not be used for transport owing to the all-conquering tsetse fly. It had been said by our ancestors that man was the crown of creation, but man was having a very hard fight of it with organisms which were certainly not the crown of creation, and it was not perfectly clear to him as yet that man was getting the best of the fight. There were aspects of medical science which almost indicated that at the present moment the battle was not going in favour of the superior animal. If that was true what was needed was a combination of all branches of science, and the work of a society such as the Royal Society of Tropical Medicine and Hygiene, was a necessary part of the machine. A man who took a medical degree and went out to a remote part of the Empire found himself face to face with tremendous problems, not only strictly medical problems, but also problems of anthropology, which could not be ignored by anyone who tried to deal with the native races. He found himself forced by his own sense of the necessity of the situation to do research, while at the same time often overloaded with routine work. He discovered very few companions who either understood the objects for which he was working or his methods, and therefore the society was of immense advantage to him, not only by furnishing him with its transactions, but because he could feel himself part of a great machine which was attempting to deal, in a broad spirit, with all these problems, and that when he came home he would find in the society those who could help him in his troubles.

In proposing the toast "Britain in the Tropics and its Defenders" the Honourable William Ormsby-Gore, M.P. said that in the past our young men went out to the tropics carrying their lives in their hands, and even to-day the odds were not quite what they ought to be, and the risks were great both to health and life. It was being realized to-day that the health of our garrisons, of our civil servants, and of traders in the tropics could not be maintained, apart from the health of those teeming millions who were living in those countries. Where problems of science and disease had to be considered it was not possible to draw national boundaries. The health of the British in the tropics was bound up with the health of their coloured fellow-subjects. Britain would never bring to the use of civilization and to the advancement of mankind as a whole the enormous resources of the tropics unless she could forward in quality of civilization and in health the interests of these coloured peoples. The task was only just beginning. It was due to the teachings of Manson and Ross that it was realized that garrison service was not enough, that the duty of Britain in the tropics was to the whole population. Above all, what was wanted in the great fight of man against insect was speed and mobility. Delay was dangerous, and foresight essential. What was needed in the tropics was the application of science, science, and more science. The great fault in the past in dealing with British tropical possessions had been timidity, the short view, and the neglect of science.—*The British Medical Journal* No. 3438, p. 1013.

EMPIRE COTTON.

Some promising Fields.

IN an account of his recent 30,000 miles tour through India, Uganda and the Sudan, which was given by Sir William Himbury at the Royal Colonial Institute, there is a detailed summary of the cotton areas, conditions, development and prospects for cotton production in the various territories visited. To some extent Empire development of cotton was due to past high prices but with an estimated American crop of 17,454,000 bales some doubt as to the future arises. He did not think the American production was due to an attempt to limit competition but merely to a desire to eliminate the effects of the boll-weevil. Under normal conditions, however, there is a sufficient attempt for cotton to provide a market for Empire products.

One item in favour of Empire cotton is that Uganda, Nigeria and African cotton generally is all of the improved quality, and worth from 1½*d.* to 2½*d.* per lb. more than middling American futures, so that should futures improve to 8*d.* per lb. Empire cotton will be likely to realise 9½*d.* to 10½*d.* per lb. which is 50 per cent. over the average pre-war figures taken for fifty years.—(*The African World*, Vol. XCVII, p. 106.)

TROPICAL WORLD NOTES.

St. Vincent.

Although the rainfall in 1925 was below normal, crops were not affected to any serious extent, and production of arrowroot and cane syrup was higher than during the previous year. The returns for cotton and minor crops were average, but there was a marked increase in the production of copra. The Colony's revenue, which amounted to £62,450 is the highest on record, and £11,300 more than estimated. The value of the total trade of the Colony for the year 1925 was £441,848, as compared with £310,939 for 1924. Exports were valued at £229,941, an increase over 1924 of £79,130; imports were valued at £211,907, an advance of £51,809. Exports of arrowroot rose from 2,952,535 lb. in 1924 to 3,190,412 lb. but prices were good, and the value of exports was £125,078, as compared with £51,361 for the previous year. Values for cane syrup were higher during 1925 and better prices were obtained for the Sea Island cotton produced locally. Shipments of cassava starch declined from 634,631 lb. in 1924 to 470,284 in 1925. It is gratifying to observe that the United Kingdom has benefited from the increase in imports, those from there in 1925 amounting to £75,914, against £51,834 in 1924. Imports from Canada and the United States increased in value, but not to the same extent. The most noticeable advance was in machinery, which rose from £1,976 in 1924 to £10,465. Cotton goods increased from £23,088 to £27,616; iron and steel manufactures from £3,725 to £6,921; hardware from £2,700 to £4,093; cement from £1,404 to £3,380, and boots and shoes from £2,678 to £3,695.—(*The Board of Trade Journal*, Vol. CXVII, p. 553.)

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Turks and Caicos Islands.

The latest Colonial Report on the Turks and Caicos Islands (No. 1304, H.M. Stationery Office, Adastral House, Kingsway, W.C. 2, price 6d. net) gives the total value of imports during last year as £41,570, of which £4,592 came from the United Kingdom, £3,520 from the Dominions, and goods to the value of £31,260 from the United States. All imports from foreign countries amounted to £33,458. Imports consisted mainly of general merchandise, including food, drink and clothing.

Exports were valued at £39,062. Shipments to the United Kingdom amounted to only £485, the takings of the Dominions totalled £18,412, and exports to foreign countries were valued at £20,165. Canada took products to the value of £15,117, and the United States £18,209. The bulk of the exports consisted of salt. Of the total shipments only £842 represented the value of re-exports. Conchs, sponges, cotton, sisal and shells are among the other products exported.—(*Chamber of Commerce Journal.*)

Jamaica.

An exhaustive report has been presented to the Legislative Council for the encouragement of the minor industries of Jamaica. Two desirable pieces of legislation have been recommended, namely, the enforcement of the Agricultural Produce Protection Law so as to bring about an improvement of the quality of produce and ensure satisfactory prices abroad, and the enforcement of the Food Adulteration Law, so that imported butter shall be sold for what it is, thus giving local manufacturers of creamery butter an advantage.

Amongst the non-controversial suggestions could be put the appointment of industrial chemists to advise, in such industries as those associated with bananas, figs, coconut oil, soap, preserves, butter, &c., also irrigation systems for the dry sections of the country. Some recognition of the desirability of agricultural co-operation is shown by the suggested establishment of a depôt in Kingston.

As one would expect there is an amendment of the tariff system for the protection of rope, leather, edible oil, corn, biscuits, cassava, meal, home made sauce, potatoes, chocolate, matches, soap, tobacco, and native cigarettes. It is urged that the imported duty on rope should be increased by 20 or 25 per cent., also a heavy duty should be put on cotton seed oil; the duty on imported corn should be doubled; cornmeal and flour should carry a heavier tax to encourage native meal; the duty on imported potatoes should be doubled; the duty on imported tobacco and cigarettes should be increased by 33⅓ per cent. It is also interesting to note that two schemes which have been presented to the Government in connection with the colony's desire is a direct steamship line to and from the United Kingdom to afford Jamaica better opportunities for the marketing of her fruits and other products, will probably be discussed in the autumn session of the Legislative Council.

One of the schemes has been submitted by a more or less local company which has been engaged in the fruit trade with America for the past eight years. This company is not seeking a subsidy. It is prepared to make arrangements for the procuring of the necessary ships for the service and for the marketing of bananas, &c., on the basis of co-operation. The second proposal, which has its origin with the Jamaica Producers' Association, is very ambitious. The association, which represents every section of the planting community, desires, in addition to providing cargoes of fruit for the competitive trade with the United Kingdom, to own a line of ships. It has consequently proposed that the colony should guarantee interest and sinking fund on a loan of £2,000,000 (which, it is suggested, should be floated in the London market) to construct and equip five large passenger and cargo steamers for the service, an individual conversant with the handling of shipping business being appointed to manage the operations of the line in Jamaica, and a similar person to be engaged for the same purpose in England.

The association proposes to organize a large distributing agency in England.—(*The Times.*)

Barbados.

A Colonial Report on Barbados for 1925-26 (No. 1,301, H. M. Stationery Office, Kingsway, London, W.C. 2, price 9*d.* net) states that the total value of the imports into the Colony during last year was less than that for 1924 by £262,520, the figures for the respective years being £2,293,777 and £2,556,297. This was due to smaller receipts of animal foods, flour and meals, salted and canned meat, and timber, &c. The United Kingdom was the principal country of origin with a share of 36.3 per cent., followed by Canada with 20.9 per cent., and the United States 18.7 per cent., other British Possessions accounting for 15.2 per cent. The import values were as follows :—United Kingdom, £834,681 ; Canada, £479,979 ; United States, £427,438 ; and other British Possessions, £347,849.

The fall in the price of sugar during 1925 and the previous year, had a material effect on the export trade of the Colony, the general prosperity of Barbados being almost entirely dependent upon the success of its sugar crop.

Total exports from Barbados last year were valued at £1,421,035, as against £1,858,301 in 1924, and £2,189,740 in 1923. Exports of sugar decreased from £1,226,014 in 1923 to £997,869 in 1924, and to £686,238 in 1925. Molasses also showed a considerable drop as compared with 1924, the figures being £524,927 in 1924 and only £395,910 during last year. Rum and cotton also showed decreases. The quantity of sugar shipped however, rose by 6,120 tons during the year, while molasses showed an advance of 1,881,822 gallons. Other articles of export were biscuits, cotton seed meal, fruit and nuts, hides and skins, building lime, manjak, edible oils, and fresh vegetables. The United Kingdom's share of exports from the Colony totalled only £204,970, Canada being the leading customer with £767,619. Other British Possessions accounted for £97,001, while the United States took £54,909.—*Chamber of Commerce Journal.*

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Nigeria.

At a meeting of the Administrative Council of the Empire Cotton Growing Corporation on 20th October, the Hon. W. G. A. Ormsby-Gore, M.P., Under Secretary of State for the Colonies, gave an account of his recent tour in West Africa, including the cotton-growing area of Nigeria. He stated that the failure of American cotton had been followed up by an attempt to improve the indigenous native cotton which could stand the various pests and troubles there. The Entomologist, Mycologist and Plant Breeder were endeavouring to isolate a strain of a satisfactory staple and colour. Laboratory tests had been amazingly successful so far and after another year of selection they could begin to multiply and later distribute the improved variety of seed to the native growers. When this was done there would be provided an entirely new cotton of immense potential value.—(*The African World*, Vol. XCVII, p. 111.)

Tanganyika.

The whole question of the development of the south-eastern highlands of Tanganyika Territory, as well as the basin of Lake Nyassa depends on suitable railway communication with the coast. Several opinions have existed as to the best route which the line should take. The opinion of the East Africa Commission was that the line should start from Ngerengere, on the Central Railway, and should run south-west to Inanda, on the north-east shore of Lake Nyassa. Existing data suggested that the line should run up the Kilombero valley, described as potentially one of the finest cotton, sugar and rice producing areas in the world, and through the Pitu valley, described as one of the richest grain areas in the country.

Since then, with fuller knowledge, this route has been practically abandoned. It did not figure among the schemes submitted by the Tanganyika Government to the East Africa Guaranteed Loan Committee ; its place being taken by a project for a line starting from Dadoma, on the Central Railway, and running south-westward to Fife, in North-Eastern Rhodesia, by a route which would not touch Lake Nyassa. The Loan Committee would have nothing to do with the Commission's project, beyond recommending surveys.

Meanwhile, preliminary surveys were being made by Mr. Gillman, a railway engineer of the Tanganyika Government. In his recent lecture to the Royal Geographical Society, Mr. Gillman did not discuss the recommendations of either committee, but it would seem that he endorses the East Africa Committee's proposed route, but does not give nearly such a glowing impression of the prospects of development along the route.

The Great African Lakes are, indeed, remarkably well guarded against the inroads of railways. The opinion has often been offered that such trade as Lake Nyassa may offer, hemmed in as it is by mountain ramparts, would best find an outlet through Nyassaland to Beira. Even so, there remains the problem of an outlet for the highlands above the northern end of the lake. Hence the Dadoma-Fife route has been urged as an outlet for this district. Mr. Gillman does not believe that this region is likely to be a second Kenya, as thunder storms and hail are frequent, timber is largely lacking, and the climate is not too healthy. Cattle, however, in this country do well, and sheep farming appears to be worth encouraging.—(*The Field.*)

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Ecuador.

A survey has recently been made by the Department of Agriculture of the wild cinchona plants which grow in the Andes at an altitude of between 3,000 and 9,000 feet. The production from these trees can be increased to 2,000,000 kgs. of bark per annum (equivalent to 40,000 kgs. of quinine sulphate) if regulations for the collection are enforced and the industry better organised. By opening up new roads it will be possible to obtain 6,000,000 kgs. of bark yearly, yielding 2 per cent. quinine sulphate on the average.

SUGAR NOTES.

Compiled by the College Department of Sugar Technology.

Pen Manure and Plant Cane.

In his report on Manurial Experiments on the estates of the Ste. Madeleine Sugar Co. (Trinidad) G. A. Jones, Agronomist, states that the application of 20 tons of pen manure per acre to plant cane, gave an increase of 7.8 tons of cane or 23.7 per cent. This is more than 9 times the error of the difference, and hence is statistically significant. As the manure is worth 8-10 shillings per ton and the value of the increase in canes is from £5-7, the manure did not pay for itself on the plant cane. The beneficial effect of pen manure, however, extends to the ratoon crops as well.

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Effect of Warm Water Treatment on the Germination of Sugar-Cane.

Treatment of plant cane with warm water is not only helpful in combating diseases and insects, but increases the germinating power of healthy cane. The eyes on the lower part of the stalk, which do not germinate as readily as those at the top, give good germination after treatment at 52° C. for 35-40 minutes, the middle section of the stalk requires 52° for 30 minutes, and the top gives the best results at 50°-51° for 30 minutes. The theory is advanced that the glucose ratio is increased by the treatment, and that this has an effect on the germination.—(A. J. J. Berg in *Arch. Suikerind.* 34, 1926.)

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Comparative results of Clarification methods in Java.

Factory control results for crops 1924 and 1925 in Java clearly show that Carbonatation removes the largest per cent. of non-sugars, followed by defecation and then Sulphitation. The Carbonatation process gave the smallest quantity of molasses accompanied by the lowest purity (sucrose Brix.); losses in press-cake and unknown losses were also the lowest. The total sucrose not recovered in Carbonatation factories was 7.9 per cent. on polarization in cane in 1924 and 7.6 per cent. in 1925; for Sulphitation factories it was 10.4 and 10.1 respectively. The figures for defecation factories were midway between the other two groups. The reason for there not being more Carbonatation factories in Java is the high cost of limestone and coke.—(*Arch. Suikerind.* 34, 1926.)

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Hawaii's Sugar Production.

The production of Sugar in Hawaii in 1906 was 430,000 tons. In 1916 it was 587,000 tons and in 1926 it was 787,000 tons. The quantity of sugar per acre in 1906 was 4.47 tons; in 1916 it had risen to 5.14 tons and in 1926 to 6.39 tons. Credit for a large share in the increase in production is given to the work of the Experimental Station, which now has a staff of over 40 members.—(*Facts About Sugar*, Sec. 4, 1926.)

Over-stimulation of Sugar Production.

From various quarters the unsettled condition of the Sugar Industry is blamed on excessive protection by means of high tariffs and bounties. Dealing with "Some Aspects of Cuban Reciprocity" in *Facts About Sugar* (17th July, 1926) Mr. Sidney Ballou has the following to say about the agitation in Cuba for higher protection from the United States.

"Reciprocity was originally given to Cuba solely for its protective value in her behalf. Possible competition against the domestic industry was expressly disclaimed.

"The avowed theory of protection tariff is to encourage production in the protected territory. If the increase does not come up to expectations it may be either that the protection is insufficient or that natural advantages are lacking. On the other hand if production is stimulated beyond the extent desired, the only rational explanation is that the protection has been excessive."

To prove his point the author gives the following figures showing the Surplus Production of Cuba over import requirements of the United States.

	Long Tons.
1905	(Deficit.)
1910	91,774
1915	730,336
1920	1,048,597
1925	2,183,124

and continues:

"This shows every symptom of an overdose of protection and brings out the absurdity of Cuban agitation for more of the same medicine."

The *Journal des Fabricants de Sucre* of 21st August, 1926, under the heading "Too Much Sugar" dealing with the evils of over-protection as affecting the industry generally, says among other things.

"The sugar industry is surfeited by protection and is suffering from a consequent inability to adjust production to demand at prices determined according to correct economic principles and bearing some reasonable relation to marginal production costs.

In a mad desire to encourage the growth of sugar-cane or sugar beets, as the case may be, tariffs and bounties have been so lavishly distributed both by European countries and by the United States that it is impossible to conjecture at what point price equilibrium would occur if artificial barriers were removed . . . The universality of the evils of state subsidy, the fact that sugar is a world crop with its price fixed (with due allowance for tariffs) in world markets makes it almost impossible for any single country such as Cuba, for instance, to fight to prevent over-production and raise prices. Probably restrictions in one part of the world, if they do affect prices, will merely act as an incentive to tariff-protected interests elsewhere to grow and refine more sugar."

THE PRINCIPAL'S REPORT

For the Academic Year 1925-1926.

THE passing of the Academic year 1925-26 has witnessed the second final examination for the Diploma of the College. The three students who sat for this examination passed it successfully, one obtaining honours in the Technology Course.

Staff.

1. I have held charge throughout the year, but was absent from the Island from 3rd March to 19th June on a visit to England in connection with the business of the College. During my absence, Professor H. A. Ballou kindly officiated as Principal, carrying on the local duties.

2. There has been no increase in the strength of the staff of the College as hitherto constituted, but we have a somewhat large "Valete" list. Owing to his acceptance of the post of Mycologist at the Imperial Bureau of Mycology, Kew, Professor Ashby left the College in April last and his place has been taken by Dr. H. R. Briton-Jones, D.Sc. (London), Ph.D., D.I.C., A.R.C.S., whom we welcome to the staff. Dr. C. L. Withycombe, Ph.D., M.Sc., D.I.C., F.E.S., lecturer in Entomology, has resigned that post on the staff from the end of the session, having accepted the appointment of Lecturer in Zoology and Entomology at the University of Cambridge. Mr. P. E. Turner, B.Sc., A.I.C., lecturer in Chemistry, has accepted the post of Chemist to the Froghopper Committee of Trinidad, to which he has been seconded for a period of three years. He continued his work in the College up to the end of the session and returns in the autumn after a period of leave to take up his new work. Our best wishes go to these members, and we wish them well in the future. Professor O. F. Boyd, B.A., Professor of Sugar Technology, left the staff at the termination of the session 1924-25. His place during the year was taken as a temporary measure by Mr. W. Scott, B.Sc., Technologist, of the Usine Ste. Madeleine. The subject of Sugar Technology is dealt with in a subsequent paragraph.

Owing to the establishment of a department of Tropical Hygiene and Sanitation, a subject which is dealt with in greater detail in a subsequent paragraph, an addition has been made to the staff by the appointment of Dr. E. A. Seagar, M.B., Ch. B., to the new post of Professor of Tropical Hygiene and Sanitation. Dr. Seagar arrived in Trinidad in December, 1925.

Leave in extension of the vacation for the purposes of study was granted to Professors Ballou and Hardy, Dr. Withycombe and Mr. Turner respectively acting for them.

Courses.

1. To the Diploma Course of the session 1925-26, eight students were admitted, bringing the total to fifteen. To take the post-graduate course qualifying for the Associateship, thirteen students were admitted, of whom seven were sent by the Empire Cotton Growing Corporation, and two by the Colonial Office, the remainder being private students. One Diploma student returned to take the 4th Year in Sugar Technology. Three students attended and took the special one-year course, while three members of the staffs of factories situate in Trinidad attended for a period of a few months.

2. The Associateship for which students taking a post-graduate course have to present a thesis at the end of the year has been granted to six students, while the work submitted by two students who attended the College before the terms of the Associateship were defined and who were qualified to apply by attendance at a post-graduate course, has been accepted and these students have been awarded the Associateship.

The following are the papers that have been presented and accepted as theses qualifying for the Associateship.

J. C. HOPKINS.	Notes on the Soft Rot of Cotton Bolls in the West Indies caused by *Phytophthora*. This paper has appeared in the Annals of Botany, April, 1925, XXXIX, 154, pp. 267-280.
J. W. COWLAND.	(1) A description and Short Notes on the Sweet Potato pyralid moth. *Megastes Grandalis. Guen.* (2) *Carsidara malachrae* n. sp. Pysllihae. (3) Notes on the Chinch Bug as a pest of grass lawns. The first of these has appeared in Bulletin Entomological Research, March, 1926, XVI, 4, pp. 369-372.
F. E. KENCHINGTON	Inheritance in Cotton.
H. G. MILLER.	A General Developmental Study of Cotton grown at Different Spacings.
E. R. GUEST.	On the inheritance of certain Characters in the Cowpea. (*Vigna sinensis*).
J. C. HAIGH.	Inheritance Studies in *Stizolobium* spp.
J. V. LOCHRIE.	Inheritance Studies in *Dolichos Lablab*.
H. C. E. BULWER.	Studies on Green Manure Crops.

3. The final Diploma examination was held in June, 1926, when three students appeared. All qualified for the Diploma; two of these qualified in sugar technology and have applied for admission to the 4th year course in that subject. The single student to pass out in general agriculture has secured employment in British Guiana.

4. The field from which students are drawn is ever widening. In addition to the West Indies and the United Kingdom students in residence during the year have come from the Union of South Africa, 4; Brazil, 1; Egypt, 1; and Ecuador, 1.

Research and Investigation.

As in the previous year, the amount of research carried out has again been severely restricted by the shortage of staff. The major items are the following :—

1. *Bananas.*—The year has been characterised by the appearance of the Fruit Report, the result of the deliberations of the Imperial Economic Committee. A large section of that report is devoted to the subject of bananas and among the recommendations made is one that advantage should be taken of this College to develop the investigatory work. Meanwhile, the informal Committee referred to in last year's report and composed of officers of the Department of Agriculture, Trinidad, and of the College has continued to function. The importance of securing a banana immune to Panama Disease remains a prime consideration. The Giant Fig maintains its reputation for immunity and, at the suggestion of the Committee, arrangements have been made for its extended cultivation, the College growing one acre. The question of its carrying capacity has still to be answered. Trial shipments have not proved satisfactory for this purpose. One of the main factors is temperature, though humidity and gases are also of importance. It is well known that even closely related varieties of fruit may differ markedly in their response to these factors, and preliminary attempts have been made to ascertain the temperature optimum for the Giant Fig. Action to secure other immune varieties by means of raising seedlings is being continued, but inevitably time must elapse before results can be obtained. Dr. Harland returned in January from the world's tour, which, with the valuable financial assistance of the Colonial Research Committee, he undertook, for the purpose and for a broad study of the banana plant. His report and recommendations are now before that Committee.

2. *Sugar.*—Actual field investigation has been limited by the available area but it is directed to obtaining more intimate knowledge of the parental characters of the cane hitherto growing in this area. Statistical data is also being collected.

During the year the serious inroads of the froghopper have led to an active campaign in the Island. A Froghopper Committee has been appointed and the active prosecution of the work has been entrusted to a working committee. The problem is not a single or straightforward one. There is some intimate relation between host and parasite and the degree of attack is dependent in large measure on the physiological condition of the cane plant itself. The working out of that condition favouring attack and the control of the plant so that it may avoid that condition, offer a study, the investigation of which is likely to have a much wider significance than its application to the Froghopper problem itself. The whole investigation constitutes a study of these fundamental problems, and detailed investigations of the factors which favour such adverse physiological conditions in the plant and the practical means of removing those factors are in progress; that is the main problem and it must take time; in the meanwhile the methods of direct control of the pest during the transition period have to be studied.

The problem is essentially one for co-operative attack. I, myself, am a member of the main Froghopper Committee while several members of the Staff are on the working committee. The organisation is working smoothly, and, though simplified by the problem arising in Trinidad, offers a good instance of the manner in which co-operation between the College and a local organisation can be conducted.

From a different aspect, and bearing on the manufacturing processes, a study of the significant of the Phosphate content of sugar-cane juice have been commenced.

3. *Cacao.*—The cytological study which was referred to in last year's report on the embryogeny of cacao has been continued, and the results will shortly be submitted for publication.

4. *Cotton.*—The work on this crop is passing through a transition stage. During the spring of 1925 the Island was visited by Professor (now Sir) John B. Farmer, F.R.S., and Mr. L. G. Killby, as representing the Empire Cotton Growing Corporation. As the result of that visit the Corporation has acquired an estate of some 60 acres within half a mile of the College and Dr. Harland has been appointed Geneticist. In future, therefore, cotton will form a minor subject for research at the College and its cultivation restricted to what is required for instructional purposes. The major portion of the cultures now growing at the College are under transference to the Corporation's estate. The proximity of the two institutions will, it is to be hoped, lead to mutual benefit.

5. *Tobacco.*—The work on this crop has been extended, but is concentrated on heavy manufacturing types, and does not include cigar tobacco. Half an acre has yielded over 500 lb. cured leaf which has realised a price of 3s. per lb. Curing facilities for this work, however, are severely restricted, and will be required for a full study of, and instruction in, the processes connected with tobacco growing.

6. *Citrus.*—The central problem at the present time is the Withertip disease which causes extensive damage mainly to the crop in Dominica. The problem resolves itself into one of securing a suitable variety immune to this disease. So far Kusai lime has been found to be the most suitable and it shows every indication of being resistant. Several consignments of seed of this variety have, through the kindness of the United States Department of Agriculture, Honolulu, Hawaii,

been secured and forwarded to Dominica. Dr. Harland was also instructed to bear this problem in mind during his world's tour and has made several recommendations. The question of more intensive work on this subject and of citrus generally is referred to in the scheme put forward in the Report on Fruit recently issued by the Imperial Economic Committee.

7. *Jute.*—The similarity of the flat lands of Trinidad to the jute areas of India and the desirability, in view of the froghopper blight, of broadening the basis of agricultural practice in the cane tracts by the inclusion of an additional crop, have suggested the desirability of testing out jute under the local conditions. The small area grown during the last rainy season was promising, and an extended area is now under trial.

8. *Minor Crops.*—The general study of minor crops has been continued, and collections of the different varieties of these is being extended. Genetical studies of *Ricinus*, *Dolichos*, and *Vigna* have been continued, and in view of the interest now taken in the subject of green manuring in the tropics, experiments, have been started with *Stizolobium*, which have already reached the F_2 generation.

9. *Diseases.*—With the loss of Professor Ashby, a breach in the continuity of research has naturally occurred. Dr. Briton-Jones is now taking up the subject of Green Muscardine, about which there are several outstanding points still to be settled before its use for control of the froghopper can be assured of success. The subject here opened up is a general one of relation between host and parasite, which is by no means limited to the particular problem in hand. As before, numerous identifications of insects and fungi have been made for officers of the Agricultural Departments of the Lesser Antilles.

10. *Soil Investigation.*—The soil work of the Chemistry Department centres around tropical lateritic soils; this work was commenced early in 1924, since when it has been continued, and certain results are now being prepared for publication. Work has also been continued on the physical and chemical properties of colloidal soils.

In connection with the Froghopper campaign to which reference has been made above, preliminary reconnaissance of the chief soil-types of the cane-growing lands of Trinidad has been undertaken. The work will be continued on an extended scale when Mr. Turner returns to the College to take up his duties with the Froghopper Committee.

11. *Biochemistry.*—A reference has been made above to the work in progress on the significance of the Phosphate content of sugar-cane juices. A further joint paper dealing with work in continuation of that by Professor Hardy and Mr. Warneford of the Leeward Islands Laboratory, on the Colouring Matter of Lime Juice, has appeared during the year.

(*To be concluded.*)

PROSPECTS OPEN TO STUDENTS.

It is the intention of the Governing Body to open an employment bureau for students who have passed out of the College; but up to the present the scope for such a department hardly exists. Practically every student who has successfully completed his course has found employment immediately after he has left. Meanwhile, therefore, it has been arranged that the columns of *Tropical Agriculture* shall be open to students who have passed out of the College and desire, to secure employment.

The College has been adopted as one of the principal training centres for holders of the newly created Colonial Agricultural Scholarships, particulars of which can be obtained from the Colonial Office.

The scholarships, which are post-graduate and are usually tenable for two years, are of the value of £250 per annum. Qualifications are mainly as follows:—

A candidate for a scholarship should, in other than exceptional circumstances—

(1) If applying for a research or specialist scholarship, be the holder of an Honours Degree in Pure Science, of a standard not lower than Part II of the Cambridge Natural Sciences Tripos. (A candidate for a scholarship in Agricultural Chemistry will be required to submit evidence that either as part of his degree course or subsequent to it he has received a year's instruction in methods of chemical research—not necessarily of an Agricultural nature.)

(2) If applying for a general agricultural scholarship, be the holder of a Degree (or Diploma) in Agriculture or Natural Sciences (of which Botany should be one) entailing not less than a three years' course at one of the Universities or Agricultural Colleges.

A candidate may apply before taking his final examination.

As will be seen from (2), the Diploma of the College will be accepted as a qualification. The courses to be taken by selected scholars will be at the discretion of the Secretary of State for the Colonies, but it is intended that the second year should normally be spent at the Imperial College of Tropical Agriculture. College fees (£50 in the case of the Imperial College of Tropical Agriculture) are payable by the Student.

The Empire Cotton Growing Corporation have, in the past, given studentships of £250 per annum for two years, the second of which has been passed at the Imperial College of Tropical Agriculture. These studentships are open to graduates and holders of Diplomas of Universities and Colleges throughout the Empire.—*Extract from Prospectus for 1927–28.*

CHEMICAL NOTES.

Compiled by the College Department of Chemistry and Soil Science.

Raw Rubber Research.

The November number of the American journal, *Industrial and Engineering Chemistry* (Vol. XVIII, No. 11, 1926) contains no less than twenty important papers on various phases of raw rubber growing, manufacture, and utilization. These papers were presented at a symposium held on 5th to 11th September, 1926, by the Division of Rubber Chemistry, of the American Chemical Society, at Philadelphia. The following are the titles of some of the papers presented.

1. The importance of rubber in modern civilization.
2. Botanical and Chemical developments in the plantation industry.
3. Possibilities of wild and plantation rubber production in tropical America and Africa.
4. Recent developments in the preparation of plantation rubber.
5. The production of Guayule rubber.
6. Developments in the Netherlands Indies rubber-planting industry.
7. Future commercial prospects for synthetic rubber.
8. Alternative materials for rubber.
9. Composition and structure of Hevea rubber.
10. The direct use of rubber latex, especially vulcanized latex.
11. Chemical research on raw rubber at the Netherlands Government Institute.
12. The present and future of reclaimed rubber.
13. Artificial rubber during the War in Germany.
14. Synthetic rubber.

It is impossible here to summarize the contents of these important articles. Those interested should consult the originals. The Journal in which they are published may be obtained from Mr. Charles L. Parsons, 1709 G. Street, N.W., Washington, D.C., United States of America, at a cost of 85 cents, including postage.

* * *

Manufacture of Methyl-amines.

A new process of manufacturing trimethyl-amine and dimethyl-amine has been developed by Dr. D. K. Tressler at the Mellon Institute of Pittsburg, U. S. A. The process will greatly reduce the cost of production of these substances.

Dimethyl-amine is now widely used as an accelerator of rubber vulcanization. It is also a remarkable attractant of the cotton boll-weevil, and may be used in the preparation of poison baits for destroying this pest. Trimethyl-amine has been suggested as a substitute for ammonia in the manufacture of potassium carbonate by the Solvay process. It is much more soluble than ammonia, and, if it can be produced at low cost, it may lead to improvements in yield of potassium carbonate.—(*Indus. and Engin. Chem.*, News Edition, 10th September, 1926.)

Fuel Oil from Coal.

The Bergius process for the production of oils by the hydrogenation of coal, promises to revolutionize the oil industry. The seriousness with which its possibilities are regarded in Britain is indicated by a lengthy reference to it in Lord Balfour's Messel Memorial Lecture at the Mansion House, London. Lord Balfour said " The oil wells of the world, are " probably going to be quite inadequate for the " growing demands. I do not doubt that the fuel " resources in oil wells are going to increase, but I " find it hard to believe that the demand for those " particular products will not tend to outstrip the " supply, and it would be an incalculable advantage " if we could supplement the supply of oil fuel by " some process which would enable us to turn some " of our coal into oil-fuel."

Rights in the Bergius process have already been purchased by The Makot Company of Holland, and an affiliation of British firms has been formed with the intention of buying shares in this Company. Furthermore, the British Bergius Syndicate has been established to exploit the British patents of the International Bergius Company which is registered in Holland. — (*Industrial Chemist*, September, 1926.)

* * *

Vitamins in Papaw fruit.

The high medicinal and food value of the papaw is already well known ; any further facts pertaining to its composition and properties are bound to be of interest. According to a Report published in 1914 by the Hawaiian Agricultural Experiment Station, the average percentage composition of papaw is ; water, 86.51 ; crude fibre, 0.6 ; carbohydrate, 10.6 ; protein, 0.4 ; fat, 0.10, and ash, 0.76. The fruit owes much of its value to the fact that it contains a protein-splitting enzyme called papain. In addition, the recent work of Dr. Carey D. Miller of the Household Science Laboratory, University of Hawaii, Honolulu, published in *The Biochemical Journal*, vol. XX, No. 3, 1926, p. 515, demonstrates that papaw fruit contains an abundance of vitamin C (the anti-scurvy vitamin), a large amount of vitamin B (the anti-neuritic vitamin), and a fair amount of vitamin A (the fat-soluble, growth-promoting vitamin). The yellow colouring matter so characteristic of papaw fruit, was found by Dr. Miller to be carotin, which has been suggested by some authorities to be identical with vitamin A, or at least to be closely related to it.

* * *

Manufacture of Artificial Silk in Norway.

The Tinnfos Papirfabrik Company of Norway has entered into negotiations with a large British artificial silk company for disposing of its whole output of fine cellulose. A factory is eventually to be built at Notodden, near the large nitrogen-fixing plant of the Norsk Hydro. Here hydro-electric power will be employed for converting cheap Norwegian wood cellulose into artificial silk.—(*Indus. Engin. Chem.*, News Edition, 10th August, 1926.)

REVIEWS.

THE CHEMISTRY OF RUBBER MANUFACTURE, by L. E. Weber, London, Griffin & Co., 1926.

This book is a revised version of a well-known work, "The Chemistry of India Rubber," the first edition of which appeared in 1905, and was written by the author's father. Since the older book was published, the plantation rubber industry has come into being; the reclamation of waste rubber has become a profitable process, and many valuable vulcanizing accelerators have been discovered. Hence this new book differs materially from its predecessor and contains much fresh subject matter. Topics such as the composition of rubber latex; the nature of the coagulation process; the composition and preparation of crude rubber; vulcanization; synthetic rubber; rubber analysis; compounding ingredients and accelerators, are all more or less adequately considered. A pleasing feature of the book is the numerous references to original papers. Whilst the general descriptive matter appears to be clearly presented, it is evident that discussions of theories, such as those relating to coagulation of latex and to vulcanization, are not quite up-to-date. No mention is made, for example, of the iso-electric theory of coagulation, which was successfully applied by W. N. C. Belgrave in 1923 to explain this process, and the general treatment of the colloidal aspect of the behaviour of rubber systems, leaves much to be desired.

F. HARDY.

* * *

AN ELEMENTARY MANUAL ON INDIAN WOOD TECHNOLOGY, by H. P. Brown, PH. D., Government of India Central Publication Branch, Calcutta 1925, pp. IX+121. Price Rs. 4 or 6*s*. 9*d*.

The author states in his preface that while in charge of the section of wood technology at the Forest Research Institute, Dehra Dun, the difficulties of instructing students in the structure of Indian timber, without an adequate text-book, were very apparent and as a result he produced the manual under review which is "intended primarily for students undergoing preparatory training."

In consequence the first four chapters are devoted to explaining the botanical knowledge essential to a proper understanding of this subject. Chapter V deals with those features of wood decipherable with the naked eye or at low magnification (10 x or less), *e.g.*, medullary rays, seasonal rings, &c., and is followed by a short chapter on the physical properties of value in identification — colour, lustre, weight, &c., Chapter VII is the largest section of the book and in this the microscopy of the timbers of chir pine and teak is dealt with in considerable detail. The latter part of this chapter deals with variations in microscopic features which are of diagnostic value.

The book concludes with a key to sixty of the most important Indian timbers, based on their microscopic features.

It is copiously illustrated throughout with excellent drawings and photomicrographs but unfortunately lacks an index.

Although the author is primarily concerned with the structure as a means to identification, he gives a few hints on the interpretation of structure in terms of durability and mechanical properties, *e.g.*, "tyloses are indicative of durability . . . many of the woods which prove to be durable in contact with the soil and make suitable railway sleepers are featured by abundant tyloses" Pg. 51: "the gelatinous fibres of the legume and Anacardium families are very numerous . . . such timbers tend to check less readily upon drying because they cling to their moisture content;"—Pg. 29.

There is scope for much work in the interpretation of structure in terms of practical utility, but it may be that further knowledge of the structure of the cell wall must first be secured.

The book is a valuable addition to the comparatively small amount of literature dealing with Wood Technology and is recommended as such.

R. C. M.

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THE NATURALIST'S GUIDE TO THE AMERICAS. Bailliere, Tindall & Cox, London, 1926.

The Ecological Society of America has had since 1917 a standing Committee charged with the listing of all preserved and preservable areas in N. America where natural conditions still exist, and one result of their labours is the volume under review.

The broad divisions are by vegetation, and sub-divisions by States, for each of which are given brief accounts of topography, flora and fauna, followed by a list of natural areas and a bibliography of the ecology of the State.

The point of general interest in the book is the emphasis laid on the necessity for preserving against the continuous encroachments of civilisation certain areas where the free play and interplay of climatic, edaphic and biological factors can proceed and can be studied. Sooner or later, according to the political age of the country, this necessity must be faced everywhere, if the biologists of a future age are not to be deprived of essential material for their researches

E. E. C.

* * *

RUBBER, ITS PRODUCTION AND MARKETING by F. R. Henderson, Henderson, Helm & Co., Inc., 44, Beaver Street, New York City.

An attractive booklet of some 45 pages dealing with the production and marketing of crude rubber. Much space is devoted to a description of the mechanism of the Rubber Exchange of New York which began operations on 15th February, 1926. The text is abundantly illustrated by photographs, diagrams and tables. The cover is interesting, being made of a new product composed of rubber and specially treated cotton fibre.

C.Y.S.

COLLEGE NEWS.

The Governing Body of the College has decided to close the Milner Fund at its present figure of £87,872 1s. The Hostel, which is being erected for the accomodation of students, is to be called "The Milner Hostel" in recognition of Lord Milner's services to the College.

The College was favoured by a visit from two distinguished journalists on Saturday 18th December, who arrived on the s.s. *Coronado*. These gentlemen were on their way to Jamaica under the auspices of the Jamaica Imperial Association who authorised a committee consisting of Sir Campbell Stuart, Lord Burnham and Mr. H. E. Turner of the Empire Union Press, to select four journalists of repute to visit Jamaica. Two of these gentlemen, Mr. Harold Cox and Mr. T. S. Sheldrake arrived on Saturday, 18th December, and the other two are expected next month.

Mr. Harold Cox, who was accompanied by his secretary, Miss E. Baines, is the Editor of the *Edinburgh Review* and a well known writer on Economic problems. Mr. Sheldrake is the Editor of *The Times Trade and Engineering Supplement.*

The party who were accompanied by Sir Francis Watts, Mr. George F. Huggins, O.B.E., and Mr. A. Cory Davies, Chairman of the Trinidad Chamber of Commerce, arrived at the College at 9.30 a.m. and were met by the Acting Principal (Mr. G. Evans). A stay of three hours was made and all the details of the College workings were explained by the Professors in charge of the different scientific departments. Particular interest was evinced in the model sugar factory and the facilities it affords for the development of an advanced course of training and research in Sugar Technology; the banana breeding work aimed at counteracting the effects of Panama disease and the programme of work directed against the Froghopper Blight. A detailed inspection was also made of the students' experimental plots and the plans prepared for their boarding and accommodation next year were explained.

The party left after twelve and drove back to Port-of-Spain *via* the Saddle. After lunch with Mr. Huggins they boarded the *Coronado* at 3.20 and sailed the same afternoon.

At the General Meeting of the College Amalgamated Clubs held on the 20th December, the following officers were elected:

President ..	..The Principal, Mr. G. Evans.
Vice-President ..	..Mr. J. E. Symond.
Secretary ..	..Mr. J. A. Potter.
Treasurer ..	..Mr. L. S. Birkett.
Staff Member ..	..Professor F. Hardy.
Diploma Student Member	..Mr. A. E. W. Sheffield.
Capt., Association Football	Mr. R. G. Heath.
Do. Rugby Football	..Mr. C. O. Oates.
Do. Cricket	..Mr. T. D. Rutter.
Do. Tennis	..Mr. J. A. MacDonald.
Do. Hockey	..Mr. L. H. Stone.

The College received a visit on 23rd December from Captain D. Teselius and Commander Tor Alungrey of the Swedish armoured cruiser H.M.S. *Fylgia* which stayed for several days in Port-of-Spain harbour. This vessel is making a tour of the West Indies and the Spanish Main. The visitors were shown round the College and expressed great interest in its various phases of activity and stated that they were interested to learn for the first time that the British Empire had started an Institution of this sort for training and research in Tropical Agriculture. The visitors were entertained to lunch by the Acting Principal and Mrs. Evans who later on in the afternoon returned the call on the *Fylgia*. Previously this warship had challenged the College to a match at Association Football. After a vigorous and sporting game the College emerged victorious by two goals to one.

During the Christmas vacation a visit was made to St. Vincent to study cotton growing under field conditions and an account will be found on page 25. Accompanying the Acting Principal were Professors H. R. Briton-Jones and E. E. Cheesman, and the following Post-Graduate Students: Messrs. M. Afzal, D. W. H. Baker, P. A. Bowmaker, W. P. K. Findlay, M. Greenwood, W. V. Harris, K. T. Hartley, O. V. S. Heath, H. K. Hewison, J. L. B. Kincaid, D. MacDonald, J. S. Moerdyk, H.Musk, V. F. O. Olivier, L. H. A. Stone, J. E. Symond, O. L. Thomas and T. L. Williams.

Mr. Henry Foy, M.A., the newly appointed lecturer in Zoology and Entomology, arrived from England by the s.s. *Carare* on the 1st January. Mr. Foy was Director of the Biological Laboratory, Holt, Norfolk, prior to taking up his appointment.

Sir Arthur Shipley, Chairman of the Governing Body of this College is expected to pass through Trinidad on the 19th of January in the s.s. *Pellerin de la Touche*. After visiting Colon, it is expected that he will return to Trinidad and remain in the Island a week or ten days to discuss College affairs.

We are pleased to be able to announce that the College Library has recently received from Mr. W. Scott Herriot, a Governor of the College, a very valuable and useful gift of bound volumes of the *British Journal of the Society of Chemical Industry*, from 1887 (Vol. VI) to 1925 (Vol. XLIV). This gift fills a long felt need in the Chemistry Department and is highly appreciated.

ADVERTISEMENTS.

MR. HENRY H. R. MOLE, of Little Neck, Long Island, New York, has been appointed advertising agent for *Tropical Agriculture* in the United States of America and Canada. All communications from those countries respecting advertisements should be addressed to him. The address of our advertising agent in the United Kingdom is 14, Trinity Square, London, E.C.3. Firms in the West Indies and British Guiana are requested to address their communications to the Editor, *Tropical Agriculture*, Imperial College of Tropical Agriculture, Trinidad.

OBITUARY.

IT is with deep regret that we have to record the sad and unexpected death of Dr. Cyril Luckes Withycombe, until recently lecturer in Zoology and Entomology at this College. While in Trinidad he was noted for his extraordinary energy in both laboratory and field and the news of his sudden death was received with amazement by all his friends in the island. In spite of his youth and absence on war service he had established himself among the foremost of our younger scientists, a fact to which his recent appointment bears testimony. His work is characterized both by its scientific soundness and its breadth of outlook. We at the College have lost not only a brilliant colleague but also a good friend and the sympathy of the entire staff is extended to his relatives.

We reprint below the obituary notice, written by one of our most distinguished scientists, which appeared in the *Times*.

Dr. Cyril Luckes Withycombe, Lecturer in Advanced and Economic Entomology at Cambridge, died at Cambridge on Sunday at the age of 28. Brought up in East London, he served in the war in the ranks of the 16th Battalion London Regiment, and on demobilization he proceeded to the Imperial College of Science, where he was the favourite and best pupil of the late Professor Lefroy. Assisted afterwards by grants from the Department of Scientific and Industrial Research, he embarked on an examination of the anatomy, biology, and relationships of the intermediate groups of insects (Neuroptera), publishing a series of papers on them in the *Journal of the Entomological Society* and elsewhere, his conclusions meeting general acceptance amongst zoologists. In 1923 he went to Trinidad as Lecturer in Entomology in the Imperial College of Tropical Agriculture. While completing his former work, he turned his attention to certain economic pests of cotton and sugar-cane, publishing a study of the Froghopper Blight in Trinidad, remarkable for its critical examination of the factors concerned the bionomics of the canes themselves, their cultivation, and the incidence of the pest. His conclusions are not likely to be popular amongst planters as they preach the greatest attention to the cultivation of the canes rather than the use of sprays, &c., to kill off the insects.

In October of the present year Withycombe took up the newly-created appointment of Lecturer in Advanced and Economic Entomology at Cambridge, and it is not too much to say that he has reorganized the teaching and establishment of his subject in the University. Zoologist, entomologist, botanist, and chemist, he presented the most modern class of scientific research, estimating every factor relating to the lives of the animals he studied, zoology mourns the loss of one of its most brilliant children and Cambridge that of one of its most promising workers.

NEW YEAR HONOURS.

MR. ORMSBY-GORE, Under-Secretary of State for the Colonies has been appointed Privy Councillor.

SIR EDWARD DAVSON, ex-President of the Associated West Indian Chambers of Commerce and a Governor of the Imperial College of Tropical Agriculture has received a Baronetcy.

BOOKS RECEIVED.

WE have to acknowledge the receipt of the following books :—

Root Development of Field Crops. (2 copies). John E. Weaver, New York, McGraw Hill Book Co., pp. 291, 16 black and white illustrations.

A Descriptive Catalogue of some of the Common Trees and Woody Plants of Kenya Colony. E. A. Battiscombe, F.L.S., The Crown Agents for the Colonies.

Fertilizers, Their Sources, Manufacture and Uses. Herbert Cave, Pitmans Common Commodities Series, Sir Isaac Pitman & Sons, Ltd., London, pp. 116, frontispiece and 17 figures, 3s. net.

Reis. Professor Dr. H. Winkler, Deutcher Auslandverlag, Walter Bangert, Hamburg, pp. 138, 17 plates.

Kaffee. Professor Dr. A. Zimmermann, Deutcher. Auslandverlag, Walter Bangert. Hamburg, pp. 204, 20 plates.

TIMBER IN FIJI.

ACCORDING to the *Auckland Star*, Mr. H. T. Price, representing a group of financiers in Brisbane, has been exploring the hinterland of Fiji with the intention of securing certain options over timber rights. Mr. Price says that his aim is to develop the manufacture of wood-pulp, veneer wood and ply-wood. His investigations have disclosed a large supply of excellent kauri and white pine, as well as a wood which is being used in New Zealand in the manufacture of butter boxes. This wood is perfectly tasteless and odourless and has no foreign matter in it. A sum of about £120,000 will be required at the start for the building of a tramway, but the opinion is expressed that there is a very large supply of fine timber which will more than repay the cost of extraction. It is also proposed to erect a large sawmill plant on the island. Altogether the prospect is described as encouraging, and if satisfactory arrangements can be made with the Government the scheme may be brought to a successful issue.—*Empire Forestry Journal*, Vol. V, No. 1.

MESSRS. VASMERS, LTD. of Shanghai House, Eastcheap, London, E.C. 3, have kindly arranged to supply us with Messrs. Woodhouse, Carey & Brown's fortnightly market report, which will be utilised in preparation of our Trend of the Markets.

TREND OF THE MARKETS.

[*The notes below are based principally upon running charts of the prices of the basic grades and upon general statistical information gleaned from contemporary publications and cablegrams and are intended to be a record of movements. An attempt is made, where possible, to indicate the market outlook at the time of going to press, but no responsibility for the accuracy and subsequent truth of such observations is assumed. Unless otherwise stated the prices quoted are spot, London.*]

SUGAR.—President Machados' restriction decree is now a certainty. At the same time European beet sugar crop estimates are reduced. Mr. Lechts' latest is 6,983,000 tons against his previous one of 7,217,000 tons and last season's outturn of 7,471,000 tons—later a further reduction of 35,000 tons was made on the German estimate. The effect of the Cuban restriction on the market was discounted by its anticipation, but the actuality of the reduction coupled with decreased estimates from other sources contributed to consolidate the upward movement of the second half of November. It is thought that a shortage in the World crop of over a million tons amply justifies a still further upward movement in values. The London 'terme' market (white sugar in bond) has been very active, and prices though closing slightly below the best, show an advance of about 2*s.* to 2*s.* 6*d.* per cwt. during the month—December 18*s.* 3*d.* 1926; March 18*s.* 9*d.*; August 19*s.* 1½*d.*; December 1927, 17*s.* 3*d.* per cwt. For refining sugars the quotation on 14th January stood as follows. Foreign 96° (Cuban, Peru, &c.): 16*s.* *c.i.f.*, and perferential (B.W.I. &c.) 19*s.* 6*d.* *c.i.f.* Crystallised West Indian of Grocery character is dearer, value 33*s.* to 35*s.* 6*d.* 14th January. On the New York market the latest sales of Cuban (cable 14th January), were at $3.26 cost and freight, a fall of 16 cents on the previous day.

COTTON.—Uncertainty with regard to the ginning report of the United States Census Bureau produced irregular fluctuations in raw cotton although up to 23rd December there was a net advance. At this time last season 92.06 per cent. of the whole crop had been ginned, but this year only 83.49 per cent. has been ginned and there are good grounds for believing that some of the remaining 3,076,000 bales will never be marketed. The campaign for acreage reduction is not meeting with the expected encouragement in the South. The Liverpool market has been quiet, a fair business being done in African and Brazilian, both being advanced about 16 points, Peruvian and East Indian and American business has been quiet and Sea Island continues neglected. On 17th December Mid-American was quoted in Liverpool at 6.62*d.* West Indian Sea Island, good, stood at 2*s.* 4*d.* the cables up to 13th and 14th January being at the same figure.

COCOA.—The feature of late November and early December was a big rise in the value of Accra fair fermented, a rise which must be ascribed to speculation, other reasons not being clearly defined. In view of the general rise in cost and freight quotations it would seem that the speculators have a good opinion of the market during the coming months. Accra sales were made up to 61*s.* *f.o.b.*; on spot; Liverpool reports a large business at 60*s.* for fine quality. In spite of the usual brisk spot trade which heralds the approach of Christmas, the London market on spot cocoas was only moderately active but prices generally were denser. Spot values for 15th December were, Trinidad 70*s.* to 73*s.*; Grenada 69*s.* to 70*s.*; Jamaica good fermented 65*s.*; St. Lucia 63*s.* to 68*s.*; Guayaquil 80*s.* to 105*s.* A 14th January cable puts Trinidad mid-red *ll.t.* at 82*s.* to 83*s.* per cwt., whilst the New York quotation of the same date was 17 cents per lb. Stocks in London on 15th December were 58,305 bags against 86,248 in 1925. Stocks in France on 31st October stood at 7,602 tons (of 1,000 kilos) against 10,459 tons in 1925. The estimated stocks at New York on 30th November stood at 84,953 bags.

COFFEE.—The amounts offered for public sale continue moderate and all Colony parcels of home trade description have sold at full to dearer prices. An active demand for Kenya has advanced the price 5*s.* per cwt. Costa Rican offerings have been of poor quality. Ordinary to good ordinary Jamaica according to latest advice stood at 102*s.* to 103*s.* per cwt.; Surinam, Liberian about 95*s.* per cwt. Superior Santos is quoted at 87*s.* cost and freight and it is said that the President intends to relieve the position by stabilizing the exchange at 6*d.*

RUBBER.—With poor demand and adequate supplies early, December trade was poor and spot at 1*s.* 6¾*d.* was believed to be attracting outside speculators. Demand movements were awaited with interest. By the 8th the news of the American buying pool had unsettled the market and produced an immediate increase of a penny a lb. which was not maintained. Following this there was little change in values and small business, the most important thing being the announcement of the numbers of the unused coupons by the Colonial Office—Malaya, 24,839 and Ceylon 15,000. Later there was more activity due to optimism in America and considerable business was done on spot at 1*s.* 6¾*d.* per lb. With considerable stocks in England (25th December, 48,382 tons as against 5,543 tons last year) and consequent heavy warehouse charges a certain amount of impatience may be expected on the part of the holders.

COPRA.—Except for a stable period in the first week of December, prices have declined persistently although good total sales were made if low prices were accepted. On 15th December the *f.m.s.* quotation was £25 12*s.* 6*d.* sun dried Dutch East Indies £25 10*s.* and the nominal value of Jamaica and Trinidad about £26 a decline of 35*s.* on the figure in last month's Journal. The *c.i.f.* quotation on 14th January was £25 15*s.* 0*d.* per ton.

PALM KERNELS.—For reasons not apparent to the trade there has been a decided fall since the beginning of November (£20 5*s.* 0*d.* to £19 5*s.* 0*d.*) to a level which ordinarily would not induce shipment.